

RESEARCH  
INTERESTS

Scientific Computation, Mathematical Modeling, Fluid Dynamics, Preconditioners, Spectral Element Method, Domain Decomposition, Multi-phase Flows.

## EDUCATION

**University of Maryland**, College Park, Maryland  
Ph.D. Applied Mathematics and Scientific Computation. 2008  
Dissertation: *Fast Solvers for Models of Fluid Flow with Spectral Elements*.  
Advisors: H.C. Elman & A.E. Deane

**University of Southern Mississippi**, Hattiesburg, Mississippi  
B.S. Mathematics, Summa Cum Laude. 2001  
Thesis: *Periodic Solutions to Duffing's Equation via the Homotopy Method*.  
Advisor: T.H. Fay

PROFESSIONAL  
EXPERIENCE

**National Institute of Standards and Technology**, Gaithersburg, Maryland  
Mathematical and Computational Sciences Division  
National Research Council Research Associate 2008-Present

**University of Maryland**, College Park, Maryland  
Department of Computer Science  
Research Assistant 2007-2008

Applied Mathematics and Scientific Computation Program  
Graduate Student Advisor Spring 2006

Department of Mathematics 2004-2006  
Teaching Assistant 2001-2003

Institute for Physical Science and Technology  
Research Assistant 2002-2004

**NASA Goddard Space Flight Center**, Greenbelt, Maryland  
Computational Technologies Project  
Summer Intern 2004  
NASA Summer School for High Performance Computational Earth and Space Sciences 2002

**National Institutes of Health**, Bethesda, Maryland  
Laboratory of Computational Biology in the National Heart, Lung, and Blood Institute  
PRE-IRTA Fellow 2002-2003

## PUBLICATIONS

P.A. Lott, H. Elman *Fast Iterative Solver for Incompressible Navier-Stokes Equations with Spectral Elements*. In preparation.

D.L. Cotrell, P.A. Lott and G.B. McFadden *Boundary Slip Effects on the Stability of Spiral Poiseuille Flow*. In preparation.

G.B. McFadden, S.R. Coriell and P. A. Lott *Onset of Convection in Monotectic Liquid Layers*. In Review.

P.A. Lott, H. Elman *Fast Iterative Solver for Convection-Diffusion Systems with Spectral Elements*. Numerical Methods in Partial Differential Equations. Accepted.

T.H. Fay, P.A. Lott *Using the homotopy method to find periodic solutions of forced nonlinear differential equations*. International Journal of Mathematical Education in Science & Technology. Volume 33, Number 5/Sept. 01, 2002. 701 - 714.

TECHNICAL  
REPORTS

*Matrix-Free Preconditioner for the Steady Advection-Diffusion Equation with Spectral Element Discretization*. H.C. Elman and P.A. Lott, Student Paper, 10th Copper Mountain Conference on Iterative Methods. Apr. 6-11, 2008.

*Survival Guide for Graduate Students in Scientific Computation*. D. Dunlavy, C. Danforth, P.A. Lott, and R. Shuttleworth, Technical Report, AMSC program, University of Maryland, 2004.

*Finding periodic solutions to nonlinear differential equations using the homotopy method.*

P.A. Lott, Student Paper, MAA Louisiana MS 78th Annual Section Meeting Mar. 2, 2001.

*Using VisualDSolve to Analyze Nonlinear Differential Equations.*

P.A. Lott, Technical Report, Math Department, University of Southern Mississippi Jun. 23, 2000.

#### CONFERENCE PRESENTATIONS

*Fast Solvers for Models of Fluid Flow.* MD-DC-VA MAA Spring Section Meeting, Apr. 18 2009.

*Computing Steady Flow States using Fast Iterative Solvers.* 5th Annual Symposium of the Burgers Program for Fluid Dynamics Nov. 14, 2008 and Sigma Xi Sixteenth Annual Post-Doctoral Poster Presentation, Feb. 11, 2009.

*Fast Solvers for Models of Fluid Flow.* Symposium on Fluid Science and Turbulence, May 31, 2008.

*Matrix-Free Preconditioner for the Steady Advection-Diffusion Equation with Spectral Element Discretization.* 10th Copper Mountain Conference on Iterative Methods, Apr. 8, 2008.

*Fast Iterative Solvers for Fluid Flows.* 4th Annual Symposium of the Burgers Program for Fluid Dynamics, Nov. 15, 2007.

*Simulating Fluids using Fast Diagonalization.* 8th Annual Monroe Martin Graduate Research Conference. University of Maryland, Nov. 14, 2007.

*Adaptive High-Order Methods for Fluid Flows.* Inaugural Symposium of the Burgers Program for Fluid Dynamics, Nov. 18, 2004.

*Finding Periodic Solutions to Nonlinear Differential Equations using the Homotopy Method* MAA Louisiana MS 78th Annual Section Meeting. Mar. 2, 2001. 10th Annual USA/USM Mini conference in Undergraduate Research, Apr. 6, 2001.

*Using VisualDSolve to Analyze Nonlinear Differential Equations* MAA Louisiana MS 77th Annual Section Meeting. Feb. 25, 2000. 9th Annual USA/USM Mini conference in Undergraduate Research, Feb. 18, 2000.

*The Harmonic Oscillator With Periodic Forcing* 8th Annual USA/USM Mini Conference in Undergraduate Research, Feb. 5, 1999.

#### SEMINAR PRESENTATIONS

*Efficient Numerical Simulation of Advection Diffusion Systems.* NIST MCSD Seminar, Dec. 2007.

*Solving linear systems in fluid dynamics.* AMSC Student Seminar, Sept. 2007.

*Performance Analysis using Profiling and Cycle Analysis Tools.* SC Student Seminar, Oct. 2004.

#### HONORS AND AWARDS

**University of Maryland**, College Park, Maryland

SIAM Student Chapter Outstanding Service Award.

2008

College of Computer Mathematical and Physical Sciences Dean's Fellow.

2007

Goldhaber & VIGRE Travel Award.

2007

**University of Southern Mississippi**, Hattiesburg, Mississippi

Wright W. Cross Senior Scholar.

2000

Alton C. Grimes Scholar and USM NASA Space Grant Scholar.

1999

Wright W. Cross Scholar.

1998

#### SERVICE

President, AMSC Student Council & UMD SIAM Student Chapter.

2007-2008

Secretary, AMSC Student Council.

2006-2007

Co-founder & Organizer, UMD Math Department Graduation Conference.

2006-2008

Organizer & Judge, Spotlight on Graduate Research Competition.

2005

Founder & Organizer, Applied Math and Scientific Computation Student Seminar.

2004-2007

President, USM section of the Kappa Mu Epsilon Mathematics Honor Society.

2000-2001

Math Instructor, Boys and Girls Club of Seminary, Mississippi.

Summer 1998

#### MEMBERSHIP

SIAM, MAA, APS

2008-Present